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RIVERS AND CLIMATIC CHANGE: FUTURE CONFLICT OR COOPERATION

Dr. Manjita Sahay

Ph.D (PolSc)

ABSTRACT

Climate change is working on the impact of changing climate in the region likely to increase the variability of water resources affecting human health and livelihoods. Therefore, special impetus should be given towards mitigation at micro level by enhancing the capabilities of community to adopt climate resilient technological options. The adaptation strategies could, inter alia, include increasing water storage in its various forms, namely, soil moisture, ponds, ground water, small and large reservoirs, and their combination, which provides a mechanism for dealing with increased variability because of climate change. The adaptation strategies could also include better demand management, particularly, through adoption of compatible agricultural strategies and cropping patterns and improved water application methods, such as land leveling and/or drip/ sprinkler irrigation as they enhance the water use efficiency, as also, the capability for dealing with increased variability because of climate change. Similarly, industrial processes should be made more water efficient. Stakeholder participation in land-soil-water management with scientific inputs from local research and academic institutions for evolving different agricultural strategies, reducing soil erosion, and improving soil fertility should be promoted. Planning and management of water resources structures, such as, dams, flood embankments, tidal embankments, etc., should incorporate coping strategies for possible climate changes. The acceptability criteria regarding new water resources projects need to be re-worked in view of the likely climate changes.

1. INTRODUCTION:

The availability of water resources and its use by various sectors in various basin and States in the country need to be assessed scientifically and reviewed at periodic intervals, say, every five years. The trends in water availability due to various factors including climate change must be assessed and accounted for during water resources planning. As per present estimate, India receives on average annual precipitation of about 4000 Billion Cubic Meter (BCM) which is its basic water resource. Out of this, after considering the natural evaporation-transpiration, only about 1869 Billion Cubic Meter (BCM) is average annual natural flow through rivers and aquifers. Of this, only about 1123 BCM is utilizable through the present strategies if large inter-basin transfers are not considered. Thus, the availability of water is limited but the demand of water is increasing rapidly due to to growing population, rapid urbanization and economic development. Therefore, availability of water for utilization need to be augmented to meet increasing demands of water. Direct use of rainfall and avoidance of inadvertent evapo-transpiration are the new additional strategies for augmenting utilizable water resources. There is a need to map the aquifers to know the quantum and quality of ground water resources (replenishable as well as non-replenishable) in the country. This process should be fully participatory involving local communities. This may be periodically updated. Declining ground water levels in overexploited areas need to be arrested by introducing improved technologies of water use, incentivizing efficient water use and encouraging community-based management of aquifers. In addition, wherever necessary, artificial recharging projects should be undertaken so that extraction is less than the recharge. This would allow the aquifers provide base flows to the surface system and maintain ecology. Inter-basin transfers are not merely for increasing production but also for meeting basic human need and achieving equity and social justice. Inter-basin transfers of water should be considered on the basis of merits of each case after evaluating the environmental, economic and social impact of such transfers. Integrated Watershed development activities with perspectives need to be taken in a comprehensive manner to increase soil moisture, reduce sediment yield and increase overall land and water productivity. To the extent possible, existing programs like MGNREGA may be used by farmers to harvest rainwater using farm pond and other soil and water conservation measures.

2. DEMAND MANAGEMENT AND WATER USE EFFICIENCY:

A system to evolve benchmarks for water uses for different purposes, i.e., water footprints, and water auditing should be developed to promote and incentivize efficient use of water, The "project" and the "basin" water use efficiencies need to be improved through continuous water balance and water accounting studies, An institutional arrangement for promotion, regulation and evolving mechanisms for efficient use of water at basin/sub-basin level will be established for this purpose at the national level. The project appraisal and environment impact assessment for water uses, particularly for industrial projects, should, inter-alia, include the analysis of the water footprints for the use. Recycle and reuse of water, including return flows, should be the general norm. Project financing should be structured to incentivize efficient economic use of water and facilitate early completion of ongoing projects. Water saving in irrigation use is of paramount importance. Methods like aligning cropping pattern with natural resource endowments, micro irrigation (drip, sprinkler, etc.), automated irrigation operation, evaporation-transpiration reduction, etc., should be encouraged and incentivized. Recycling of canal seepage water through conjunctive ground water use may also be considered. Use of exceedingly small local level irrigation through small bunds, field ponds, agricultural and engineering methods and practices for watershed development, etc, need to be encouraged, However, their externalities, both positive and negative, like reduction of sediments and reduction of water availability, downstream, may be kept in view. There should be concurrent mechanism involving users for monitoring if the water use pattern is causing problems like unacceptable depletion or building up of ground waters, salinity, alkalinity, or similar quality problems, etc., with a view to planning appropriate interventions.

3. WATER PRICING:

For the pre--emptive and high priority uses of water for sustaining life and ecosystem for ensuring food security and supporting livelihood for the poor, the principle of differential pricing may have to be retained. Over and above these uses, water should increasingly be subjected to allocation and pricing on economic principles. A Water Regulatory Authority (WRA) should be established in each State. The Authority, inter-alia, will fix and regulate the water tariff system and charges, in general, according to the principles stated in this Policy in an autonomous manner. Such tariff will be periodically reviewed. In order to meet equity, efficiency and economic principles, the water charges should preferably/as a rule be determined on volumetric basis. Recycle and reuse of water, after treatment to specified standards, should also be incentivized through a thoughtfully planned tariff system. Water Users Associations (WUAS) should be given statutory powers to collect and retain a portion of water charges, manage the volumetricquantum of water allotted to them and maintain the distribution system in their jurisdiction. WUAS should be given the freedom to fix rates subject to floor rates determined by WRAS.

Heavy under- pricing of electricity leads to wasteful use of both electricity and water, this needs to be reversed. As an alternative, where limited ground water use for agriculture at a subsidized cost is considered desirable, separate electric feeders for such a use should be considered.

4. CONSERVATION OF RIVER CORRIDORS, WATER BODIES AND INFRASTRUCTURE:

Conservation of river corridors, water bodies and infrastructure should be undertaken in a scientifically planned manner through community participation. The storage capacities of water bodies and water courses and/or associated wetlands, the flood plains, ecological buffer and areas required for specific aesthetic recreational and/or social needs may be managed to the extent possible in an integrated manner to balance the flooding, environment and social issues as per prevalent laws. Encroachments and diversion of water bodies (like rivers, lakes tanks, ponds, ete.) and drainage channels (irrigated area as well as urban area drainage) must not be allowed, and wherever it has taken place, it should be restored to the extent feasible and maintained properly. Urban settlements, encroachments and any developmental activities in the protected upstream areas of reservoirs/water bodies, key aquifer recharge areas that pose a potential threat of contamination, pollution, reduced recharge and those endanger wild and human life should be strictly regulated. Environmental needs of aquatic eco-system, wetlands and embanked flood plains need to be recognized and taken into consideration while planning. Sources of water and water bodies should not be allowed to get polluted. System of third-party periodic inspection should be evolved, and stringent

punitive actions be taken against the persons responsible for pollution. Quality conservation and improvements are even more important for ground waters, since cleaning up is very difficult. It needs to be ensured that industrial effluents, local cess pools, residues of fertilizers and chemicals, etc., do not reach the ground water. The water resources infrastructure should be maintained properly to continue to get the intended benefits. A suitable percentage of the costs of infrastructure development may be set aside along with collected water charges, for repair and maintenance, Contract for construction of projects should have inbuilt provision for longer periods of proper maintenance and handing over back the infrastructure in good condition. Legally empowered dam safety services need to be ensured in the States as well as in Centre. Appropriate safety measures, including downstream flood management, for each dam should be undertaken on top priority.

5. ENVIRONMENTAL CONCERNS:

Another bone of contention, between the countries has been the nature of hydroelectric projects and the devastation they inflict upon the environment According to the report by Datta of IDSA, Bangladesh complains that the Farraka barrage has caused massive environmental destruction in the country. The diversion of the Ganges River has affected fishing and navigation in Bangladesh, bought unwanted salt deposits into farmland. It has also had a negative impact on agricultural and industrial production. This has had a direct impact on the Bangladeshis, who depend on the Ganges River for their sustenance. One of the most serious consequences of India's continuing search for irrigation water is expected to be the further drying out of the Sundarbans, the world's largest coastal forest, a world heritage site shared by India and Bangladesh and vital for fish. "The forest needs fresh water to survive. Because of the Farakka dam fresh water is not reaching there and the rivers are silting up rapidly. Similarly, there are groups of people in Nepal who have expressed their displeasure at the submergence of their territory and the resultant displacement caused by the Kosi barrage. To add to this, there are complaints of inadequate compensation by the Indian side that was, under the agreement, responsible for providing compensation for the land acquired in Nepal as well as all damages done in the course of the construction of the barrage. India's control and management of the barrage was also considered as an infringement on Nepal's territorial sovereignty. Another area of dispute between the two countries has been the Mahakali Treaty. In 1996, the then Nepalese PM Sher Bahadur Deuba and the then Indian PM, PV Narsimha Rao signed the Mahakali treaty for the joint development of the Mahakali River in Delhi. The main tenet of the treaty was the Pancheshwar Project, which would produce 6000MW of hydropower by 2002. The major benefits of the treaty would be irrigating agricultural land in India and Nepal and flood control management in both the countries." According to an article in one of Nepal's dailies Nepal considers this treaty as flawed, lacking clear provision of what constitutes Nepal's water rights. It specifies that Nepal Would get 4 percent of the water supply but does not specify the amount of water that India would get. According to Nepal, to assume that India would get 96 percent is highly flawed.

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